6. End office routes call via the AT&T-specified Modified Operator Service FG-C trunk group to AT&T Point of Presence.

0+ Call:

(Steps 2 - 6 are functions currently performed by the ILEC originating local switch.)

1. AT&T customer dials 0+7/10 digits.
2. AT&T Line Class Code Table is checked.
3. Appropriate screening is performed.
4. Perform digit analysis and retrieve Code Index.
5. ILEC originating local switch establishes call type.
6. Perform Rate and Route screening and retrieve Route Index.
7. End office routes call via the AT&T-specified Modified Operator Service FG-C trunk group to AT&T Point of Presence.

411 Call:

1. AT&T customer dials 411.
2. AT&T Line Class Code Table is checked.
3. Appropriate screening is performed.
4. Perform digit analysis and retrieve Code Index.
5. Switch establishes call type.
6. Perform Rate and Route screening and retrieve Route Index.
7. 411 is code converted to a 900-number (specified by AT&T).
8. End office routes call via the AT&T-specified FG-D trunk group to AT&T Point of Presence.

4.1.2.4 Resource Consumption

ILECs have expressed concern that selective routing would require duplication of every class of service (and, as a result, every LCC) defined in the ILEC end office. AT&T asserts that this is not the case. All classes of services do not require replication to support AT&T local service customers. Although the ILEC is required to offer every resold class of service to every reseller. However, the number of class of service selected by a reseller, such as AT&T, is the reseller's option. AT&T may resell all services offered by the ILEC. In the interest of conservation of switch resources, however, AT&T may not require selective routing of Operator Service and Directory Assistance for all Classes of Services. It is important to note that "grandfathered" services will not be offered for resale by AT&T in the Total Service Resale or Unbundled Network Element environment. In addition, for any given selective routing option (i.e., Operator Service or Directory Assistance), only one (at most two for Operator Service) routing parameter is needed to drive outgoing trunk selection.

The following table summarizes how the incremental increase in LCCs due to AT&T's market entry may impact an ILEC switch. The 5ESS is used in this illustration. A switch resource model, which estimates the memory consumption (e.g., memory increase) of the Line Class Code solution is used to assess the impacts due to the addition of AT&T's LCCs. The data is derived by inputting an approximation of AT&T incremental LCC data to the switch resource consumption model to analyze impacts due to key parameters which are drivers and limitations of memory consumption. As AT&T does not have ILEC-specific switch parameter data, some input parameters were approximated using several test points. The consumption model is used to identify an incremental switch resource consumption based on AT&T selected parameters which are drivers of consumption. Similar conclusions are applicable to other switches. There are two cases presented showing incremental memory consumption and their impacts as driver to switch resource exhaustion. (Resource exhaustion occurs when no additional switch memory resource available on ILEC switches):

In the analysis, we considered the following parameters:

1. Machine Boundaries:
    - NRODD (Nonredundant Memory)
    - RODD (Redundant Memory)
    - UODD (Unprotected Memory)
    - CMP (Communication Module Processor Memory)

2. Logical Increments:
    - LCC-RAC (Line Class Code - Rate Center)
    - Screening Index – for determining if call should be allowed
    - DAS (Digit Analysis Selector) – for routing and charging of calls
    - Route Index – for routing of calls

Expected Input Parameter Range:

LCC [32, 64]= [x , y]

Rate Center [1, 5]

LCC-RAC = [32 to 64] X [1 to 5]

CMP usage for LCC-RAC = ([x to y] * 32) / 0.65 (in bytes)

Route Index [1, 3] (1 or 2 for Operator Service, 1 for Directory Assistance)

Screening Index [1, 2] (1 for Operator Service, 1 for Directory Assistance)

Code Destination Index = Duplicate only subset to support the AT&T subset of LCCs (set to approximate value of 110)

DAS (Maximum 99)

The following statements can be made on the incremental usage:

LCC = 32 - 64

LCC-RAC = 32 - 320 out of 6000 max.

CMP memory usage =5.5K - 13.3K bytes out of 8M bytes max.

If Directory Assistance calls are not routed, DAS = 0; otherwise duplicate number of DAS to support AT&T subset of LCCs.

Screening index = expected approximation of 110 entries since modeling relatively complex screening / routing environment.

Incremental Assessment Model Output:

MEMORY IMPACT (5ESS switch with 5E10 Generic)

Memory	Total Memory	LCC= 32, RC=1, DAS=0	LCC=64, RC=3, DAS=0
Admin Module (AM) Memory	6 mg.	8K	8K
Communications Module Memory (CMP)	8 mg.	5.5K	13.3K
Redundant Memory (RODD) - in each SM	4 mg.	6K	6K
Nonredundant Memory (NRODD) - reside in one SM	NRODD+UODD =64mg	7.6K	7.6K
Unprotected Memory (UODD) - reside in one SM	NRODD+UODD =64mg.	0.1K	0.1K

Conclusion:

Only CMP memory is impacted by the variation in class-of-service / rate-center combinations. Other resources are impacted by a relatively small, fixed resource (i.e., memory) requirement. The data (in bytes) suggested relatively low resource usage.

Increased cooperation between ILECs and ALECs, driven by regulatory requirement, is needed to thoroughly assess specific ILEC network implementation plans for OS / DA selective routing.

5ESS Switch and Disk Memory Increase to Support ALECs

Depending on the particular switch's current capacity, a 5ESS® switch may have to increase memory to support translation for ALECs. Memory expansion can be accomplished in key components. As per switch vendor documentation, the range of memory on 5ESS® Switching Modules (SMs) has had several processor board changes that increased the maximum size of the switch memory. This data can be used to determine the feasibility of increasing memory for a specific switch.

Increasing switch memory may create a need to expand disk memory on the 5ESS® switch. Switch vendor documentation provides descriptions of base and optional configurations possible. Sufficient disk space must be made available for the planned SM memory increases due to selective routing of Operator Service and Directory Assistance calls from ALEC customers.

4.1.3 1A ESS™ End Office

4.1.3.1 Selective Routing of AT&T Operator Service Call

New classes of service can be created on the 1A ESS™ switch for the AT&T customers in the Total Service Resale or Unbundling Network Element environment, and then using normal switch screening capabilities to select routes for 0+intraLATA toll / local and 0- calls to the AT&T Point of Presence. The method used by the switch is "alternate LEC routing". The 0+ traffic is routed by assigning a unique 0+ routing data element (Traffic Service Position Index) to the class of service.

AT&T customers' 0- traffic can be routed using normal screening methods by assigning AT&T's customers a unique class of service.

4.1.3.2 Provisioning an AT&T Line Class Code

The 1A ESS™ LCC Rate Center (RAC) approach uses routing techniques to manipulate the destination of 0- and 0+intraLATA toll and local calls. The techniques require the ILEC's Chart Columns to be replicated for AT&T. Each replicated chart column serves to distinguish the customers of the ALECs from the ILEC's customers. The 0- traffic is sent to the AT&T Point of Presence by using screening entries (Special Route Index) within the Chart Column. The 0+ intraLATA toll and local traffic uses the standard 1A ESS™ techniques (Traffic Service Position System (TSPS) pairs and indices). The number of 0+ routes may be two, four, or eight routes per TSPS Group (formerly "Pairs").

The 1+ and no-prefix local calls require the ILEC's screening tuples to be duplicated in the AT&T Chart Columns so as to maintain standard handling and billing practices.

For the 1A ESS™ switch, there can be a maximum of 8 sequential route indexes that can be assigned. The solution does work. Some switch reconfiguration may be necessary.

If the required route index is available, or can be made available via reconfiguration, the solution effectively provides the selected routing requested by AT&T.

For information on TSPS Index, TSP Group Number, TSPS Routes, please refer to switch vendor documentation, TG 1A:

DIV 3, SEC. 3e, March, 1995, Page 5 for Form 1304.

DIV. 3, SEC 3f, November 1995, Page 6 for Form 1305.

DIV. 3, SEC. 5d, March, 1996, Page 2 for Form 1500.

4.1.3.3 Sample Operator Service Call Flows

Assume AT&T local service customer is provisioned with the AT&T *Chart Column*. The following is standard switch call flow

0- Call:

(Steps 2 - 5 are functions currently performed by the ILEC originating local switch.)

1. AT&T customer dials 0-.
2. AT&T Chart Column Table is checked.
3. Appropriate screening is performed.
4. Perform digit analysis.
5. Retrieve Special Route Index within Chart Column.
6. End office routes call via the AT&T-specified Modified Operator Service FG-C trunk group to AT&T Point of Presence.

0+ Call:

(Steps 2 - 6 are functions currently performed by the ILEC originating local switch.)

1. AT&T customer dials 0+7/10 digits.
2. AT&T Chart Column Table is checked.
3. Appropriate screening is performed.
4. Perform digit analysis.
5. ILEC originating local switch establishes call type.
6. Retrieve TSPS Route Index.
7. End office routes call to the AT&T-specified Modified Operator Service FG-C trunk group to AT&T Point of Presence.

4.1.3.4 Resource Consumption

Generic Resource consumption model:

- There are 1023 available Chart Class Column tables available in the 1A ESS™.
- There are 8 TSP Index maximum.
- The only memory required for the 1A ESS™ switch to support selective routing is one Chart Class Column table (64 words of memory) for each new class of service. Therefore, total memory impact is (n x 64) memory words for n new classes of service.

Conclusions:

- If the required route index is available, or can be made available via reconfiguration, the solution effectively provides the selected routing requested by AT&T
- If re-engineering is required to restore memory

  To model one line class code (e.g., 1FR):

  no. of chart column = 1 out of 1023 max.

  memory used = 64 words out of 8-Kcodes (64K words)

4.1.4 DMS-100 End Office

4.1.4.1 Selective Routing of AT&T Operator Service Call

For the DMS-100 switches, Line Attributes (*lineattr*) is the equivalent of the LCCs. New *lineattr* tuples (Line Attribute Table entry) equivalent to a *subset* of the ILEC's *lineattrs* tuples must be defined for AT&T local service customer lines to define the classes of service to provide appropriate routing of 0+intraLATA toll / local and 0- dialed calls.

To implement the routing of AT&T 0+intraLATA toll / local and 0- traffic on the DMS-100, an AT&T *lineattr* is added to the Line Attribute Table. The AT&T customer line is provisioned with the AT&T *lineattr*.

The customer's 0- call can be routed to the AT&T Point of Presence by specifying in the *lineattr* tuple ZEROMPOS field with an index name of *TSPS,or RTE1* ,or other which would point to one of the 16 entries in the POSITION table to specify Office routing (OFRT) to a dedicated trunk group to the AT&T Point of Presence. If there is already an established trunk group from the end office to the AT&T Point of Presence serving the AT&T Operator Service calls, then AT&T may route the 0- calls via the same trunk group.

To implement the routing of AT&T 0+ traffic from the DMS-100 to the AT&T specified trunk group to reach the AT&T Point of Presence, the customer's line is provisioned with the AT&T *lineattr*.

4.1.4.2 Provisioning an AT&T Line Attribute

The AT&T *lineattr* provides pointers to the local calling area screening, Class of Service screening, and digit analysis. The call will be processed using Line to Treatment Translation (switch vendor documentation 297-8001-350, Standard 04.02, February 1996). The pretranslator determines the next steps of the translation. The screening process tests the digits and establishes the Call type of *OA* (Operator Assisted). After the screening processes, the class of service sub-table determines for the digits dialed, the routing table (OFRT) routes the call to its specified destination (Route Reference Index), which is a dedicated trunk group to the AT&T Point of Presence.

4.1.4.3 Sample Operator Service Call Flows

Assume AT&T customer is provisioned with the AT&T *lineattr*. The following is standard switch call flow.

0- Call:

(Steps 2 - 7 are functions currently performed by the ILEC originating local switch.)

1. AT&T customer dials 0-
2. Line Attribute Table is checked.
3. Appropriate screening is performed.
4. Perform digit analysis.
5. Use ZEROMPOS index from Line Attribute Table to point to Position Table.
6. Position Table points to OFRS Table.
7. Retrieve Route Reference Index from the OFRS (Route) Table.
8. End Office routes call via the AT&T-specified Modified Operator Service FG-C trunk group to AT&T Point of Presence.

0+ Call:

(Steps 2 - 7 are functions currently performed by the ILEC originating local switch.)

1. AT&T customer dials 0+7/10 digits.
2. Line Attribute Table is checked.
3. Appropriate screening is performed.
4. Perform digit analysis.
5. Switch establishes call type of OA (Operator Assisted).
6. Depends on the digits dialed, go to OFRS Table.
7. Retrieve Route Reference Index from the OFRS (Route) Table.
8. End office routes call via the AT&T-specified Modified Operator Service FG-C trunk group to AT&T Point of Presence.

4.1.4.4 Resource Consumption

Of significance is that the AT&T *lineattr* tuples represent a subset (for example, 1/2) of the *lineattr* tuples already assigned to the ILEC. For the selected Class of Service that AT&T is requesting as our initial offerings at market entry, there is no plan to change the existing call screening / call blocking other than the routing of Operator Service calls to our platform. It is therefore safe to assume that the AT&T *lineattrs* and associated translations is being consistent with the existing practice within the ILEC, and that a subset of the Classes of Service we are proposing is consuming significantly less resources than the ILEC projection of resource consumption assuming across the board duplication of all existing ILEC Classes of Service.

Current Line Attribute table size is 1024 entries (tuples). However, the table is expected to expand to a maximum of 2048[8] entries in the up-coming release (NA006). Furthermore, the NA007 release available 2Q97 will increase the table size to 4096 entries.

4.2 Assessment of the Line Class Code Solution

4.2.1 Advantages of the Line Class Code Solution

1. Line Class Code solution for selective routing currently provides the most immediately feasible solution.
2. This switch-based solution uses the existing ILEC switch translation and only modifies the routes for local Operator Service and Directory Assistance calls for AT&T local services customers.
3. The ILEC customer lines are not impacted by this solution.

4.2.2 Resource Consumption - Impacts Summary

It is AT&T's expectation that other resellers will request from the ILEC only an incremental subset of Line Class Codes. Given that expectation, any resource consumption analysis that assumes duplication of all LCCs is likely to be erroneous. Also, the following are some additional ways to improve the resource consumption picture.

1. Relief Due to Technology Growth

As the ILEC is concerned with the potential increase in the number of carriers that may be interested in selective routing and therefore adding the possibility of exhaustion, it is reasonable to expect that going forward, technological advances and improvements will address selective routing capability on a large scale. This is illustrated by the switch vendors planned feature enhancements in response to customer needs to meet the new demands of the industry and examples of these include: (a) the improvements in memory capacity cited above for the 5ESS® switches, and (b) the increase in number of *lineattr* tuples targeted for the next two generics of the DMS switches.

2. Interest in Selective Routing Among ALECs

The ILEC has indicated that there are other potential ALECs, but has not provided evidence as to the actual number of other potential providers, and the number of potential providers who have an interest in selective routing of Operator Service and Directory Assistance calls. As the number of carriers increase in requesting selective routing of calls, then the ILEC's position ought to be seeking a long-term solution that would make it possible to support all carriers desiring selective routing. The accommodation of a large number of ALECs requesting selective routing capability ought to be an industry-wide issue to start at this time prior to such a need becoming a reality so that a robust solution is available in the timely manner.

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[8] Please refer to *Nortel Product Service Information Bulletin* 50139.16/7-96.

3. Memory expansion, re-engineering, and removal of unused Line Class Codes can produce improvements.

4.2.3 Limitations of the Line Class Code Solution

The following summarizes the limitations we have identified while analyzing the Line Class Code solution for selective routing of Operator Service and Directory Assistance calls to the AT&T Point of Presence. The data is indicative that for Operator Service calls, the Line Class Code solution is a currently available solution.

4.2.3.1 5ESS® End Office

1. When AT&T LCCs are used for routing Operator Service "0+" and "0-" calls, an Access Verification record is not generated by the end office switch. This does not affect call processing or the ability to route and complete the call or network integrity. This makes it necessary for a negotiated arrangement in lieu of Access Records for access billing, if any. It should be pointed out, however, that there is no problem with customer billing recording (e.g., billing AMA recording) which is properly generated on the AT&T Operator Service and Directory Assistance platforms.

   When the AT&T LCCs are used for routing "411" calls, an Access Verification record is generated by the end office switch with no carrier code in the Access record

2. Using the LCC solution, the routing of 411 calls must be via direct trunking from the ILEC end office to the AT&T Point of Presence. The reason is that carrier code was not derived, so that the call will not be properly routed at the access tandem.

3. Inability to route Directory Assistance (555-1212) calls without development if the dial string of 555-1212 is used. This, however, has no impact in areas where 411 is the designated dial-string.

4.2.3.2 1A ESS™ End Office

1. When the AT&T Operator Service "0+" and "0-" calls are routed from the 1A ESS™ end office, an Access Verification record is not generated by the end office switch. This makes it necessary for a negotiated arrangement in lieu of Access Verification Records to bill AT&T, if applicable, for access charge. It should be noted, that there is no customer billing problem.

2. Inability to route Directory Assistance (e.g., 411 / 555-1212) calls without development using dial string "411" or "555-1212".

4.2.3.3 DMS-100 End Office

1. Inability to route Directory Assistance (e.g., 411 / 555-1212) calls without development using dial string "411" or "555-1212.

4.2.4 Summary Evaluation of the Line Class Code Solution

1. The Line Class Code solution is currently available for routing Operator Service (0+/0-) calls. The assessment suggested few limitation across the various vendor switch types Therefore, it is a currently available solution for immediate deployment of selective routing of Operator Service calls.
2. It is AT&T's expectation that resellers will request from the ILEC only an incremental subset of Line Class Codes. Given that expectation, any resource consumption analysis that assumes duplication of all LCCs is likely to be erroneous. Also, the preceding section 4.2.2 on "Resource Consumption - Impacts Summary" suggested additional ways to improve the resource consumption picture.
3. Any ILEC's claim of increasing the complexity as the number of resellers grow needs to be fully supported by data of the actual number of resellers that would want to operate their own Operator Service. The ILEC would also need to clarify how this complexity differs from ALECs that do not request alternate routing of Operator Service and Directory Assistance calls.

5. AIN SOLUTION

5.1 Technical Feasibility of the AIN Solution

5.1.1 Overview

The Advanced Intelligent Network (AIN) is an evolving network and service control architecture that many ILECs are deploying. AIN is an enhancement of the approach taken to provide 800 number portability and 500 number service. The fundamental concept is to move service control functions out of the switch and into a LEC-programmable service processor, so that services can be developed, modified, and deployed independent of traditional switch development cycles. AIN relies on communication during call processing among its components—the Service Switching Point (SSP) and the Service Control Point (SCP) via the Common Channel Signaling / Signaling System 7 (SS7) signaling network. In addition, AIN definition includes methods to provision, maintain, and administer the SCP.

The need for AIN 0.1 service control is detected by the SSP at several points in call processing. These points are called Trigger Detection Points (TDPs.)

Limited AIN 0.1 functionality is provided by switches that are not SSPs. Switches that are Network Access Points (NAP) can detect when a call needs AIN processing and route the call to an SSP. Even switches that are not NAP switches can use translations of class of service data to route certain calls to an SSP for AIN 0.1 processing.

Once an AIN 0.1 SSP detects that AIN service control is needed, it sends a CCS / SS7 message to the SCP containing information such as calling and called party numbers and the point in call processing. The SCP uses service control logic and subscription information to return a message to the SSP instructing it to perform further processing, such as routing.

The description provided below refers to AIN 0.1.

5.1.2 Applicable AIN Triggers

Several AIN 0.1 triggers can allow AT&T- specific routing of Operator Service and Directory Assistance calls. The Off-hook Delayed (1, below), and the Individualized Dialing Plan (2, below) triggers allow control of both Operator Service and Directory Assistance calls. The N11 and 3/6/10 digits triggers (items 3 and 4, below) are suitable for only Directory Assistance.

1. **Off-hook Delayed Trigger for Operator Service and Directory Assistance Calls.** This subscribed trigger causes a query after the customer dials digits, and occurs during the *Information Collected* TDP. The digits dialed are included when the SSP sends a query to the SCP. All subscribers to an ALEC (e.g., AT&T) that chooses to provide its own Operator Service and / or Directory Assistance would be provisioned in this manner and all calls from these subscribers would receive this treatment.

2. **Individualized Dialing Plan/Custom Dialing Plan trigger for Operator Service and Directory Assistance Calls.** This is a subscribed trigger that is created during *Information Analyzed* TDP. If this trigger is used, AT&T subscribers that desire the service would have the IDP defined in such a way as to trigger a query to the SCP for Operator Service and Directory Assistance calls. Only calls to Operator Service and Directory Assistance from customers of the ALEC (e.g., AT&T) would be processed using AIN.

3. **N11 Trigger for Directory Assistance 411 Calls.** This office-wide trigger causes a query once N11 digits are entered. This is a non-subscribed trigger. This trigger occurs at the *Information Analyzed* TDP. If the SCP provided a translation based on the identity of the customer's local service provider, this trigger can rate 411 dialed calls to any ALEC. All calls to 411 on the switch would be processed by the AIN N11 trigger.

4. **3/6/10 Digit Trigger for 555-121 and intraLATA NPA-555-1212 Calls.** This trigger is a non-subscribed, office-wide trigger encountered when the switch detects the specified leading NPA, NXX, NPA-NXX, or NPA-NXX-XXXX triggers. 555-121 can be specified as a 6 digit trigger, in order that the identity of the local service provider for the calling party may be used to control routing of this string. NPA-555-1212, where NPA is specific to the given SSP or ILEC as a local call, could be specified as a 10-digit trigger in the same way. This trigger occurs at the *Information Analyzed* TDP. All calls to these numbers in the office would be processed using AIN. Using this trigger requires all local service providers on the switch to agree to such treatment.

5.1.3 Call Flows

5.1.3.1 Off-hook Delayed Trigger for Operator Service and Directory Assistance Calls

Assume an off-hook delayed trigger for the AT&T customers. Thus, every call made by the AT&T customer that did not match an escape code such as 911, would produce a query.

1. AT&T customer goes off hook.

2. The ILEC end office looks up customer record.

3. The ILEC end office transmits dial tone.

4. AT&T customer dials.

5. SSP (end office / access tandem) recognizes the off-hook delayed trigger in the customer record.

6. SSP waits until all digits are entered, using interdigit timeout to determine end of dialing.

7. SSP creates an *Info-Collected* query, including all digits dialed in the query and the trigger identifier.

8. If the digits collected begin with 0, the SCP determines whether the call is a 0-, 00-, 01+, local, intraLATA toll, or interLATA toll call. The SCP identifies the local service provider for the Calling Party Number.

   a) If the call is 0-, the SCP returns an *Analyze-Route* message, specifying the trunk group for local Operator Service for AT&T. The SSP will route the call via the specified trunk group and signaling to the AT&T Point of Presence. No digits will be sent.

   b) If the call is 0+7 or ten digits and is intraLATA local call, the SCP returns an *Analyze-Route* message with the dialed digits and the trunk group for local Operator Service for AT&T. The SSP will route the call using the specified trunk group to the AT&T Point of Presence.

   c) If the call is 00-, 01+, or 0+7 or ten digits and is interLATA toll, the SCP returns an *Analyze-Route* message containing the digits originally dialed. The SSP will route the call according to the office dialing plan (ODP) and the selected Long Distance carrier of the calling party.

   d) If the call is 0+7 or 10 digits, and is intraLATA toll, and the ILEC network has not implement intraLATA toll PIC (IPIC), the SCP returns an *Analyze-Route* message including the dialed digits and identifying the trunk group for local Operator Service for AT&T. The SSP will route the call using the specified trunk group to the AT&T Point of Presence.

   e) If the call is 0+7 or 10 digits and is intraLATA toll, and the ILEC network supports IPIC, the SCP returns an *Analyze-Route* message containing the digits originally dialed. The SSP will route the call according to the office dialing plan (ODP) and the selected interLATA toll carrier of the calling party.

9. If the call is 411, 555-1212, NPA-555-1212 (local or intraLATA toll), the SCP returns an *Analyze-Route* message containing the routing number specified by AT&T. (NOTE: For AT&T Local Directory Assistance service, the routing number will be a 900-number.)

10. For all other calls, the digits the customer dialed are returned in an *Analyze-Route* message to the SSP to continue call processing.

11. The SSP routes the call in the line-applicable dialing plan.

5.1.3.2 Operator Service and Directory Assistance for AT&T Customers, Using an IDP/CDP Trigger

Assume an IDP trigger for AT&T local service customers. All customers of AT&T local service would be assigned an IDP. (If they already have an IDP for other reasons, such as Centrex, that IDP must be modified to include this triggering, or the customer must use the Off-hook delayed trigger, above.) In the general case, every call that begins with 0, 411, 555-121, or NPA-555-1212 (intraLATA) by the AT&T local service customer would produce a query.

1. AT&T customer goes off hook.

2. The ILEC end office looks up customer record.

3. The ILEC end office transmits dial tone.

4. AT&T customer dials.

5. The ILEC end office collects the digits and recognizes:

   a) 0, 555, 411, or

   b) NPA-555-1212, where NPA is defined to ensure the call is local or intraLATA

   as IDP access codes.

6. SSP (end office / access tandem) waits until all digits are entered, using interdigit timeout to signify end of dialing.

7. SSP creates the *Info-Analyzed* query, including all digits dialed in the query and the identity of the trigger.

8. If the digits collected begin with 0, the SCP determines whether the call is a 0-, 00-, 01+, local, intraLATA toll, or interLATA toll call. The SCP identifies the local service provider for the Calling Party Number.

   a) If the call is 0-, the SCP returns an *Analyze-Route* message, specifying the trunk group for the AT&T Point of Presence. The SSP will route the call using the specified trunk group and signaling to the AT&T Point of Presence.

   b) If the call is 0+7 or 10 digits and is intraLATA local, the SCP returns an *Analyze-Route* message with the dialed digits and identifying the trunk group for AT&T Point of Presence. The SSP will route the call using the specified trunk group to the AT&T Point of Presence.

c) If the call is 00-, 01+, or 0+7 or ten digits and is interLATA toll, the SCP returns an *Analyze-Route* message containing the digits originally dialed. The SSP will route the call according to the office dialing plan (ODP) and the selected Long Distance carrier of the calling party.

d) If the call is 0+7 or 10 digits and is intraLATA toll, and the ILEC network does not implement intraLATA toll PIC (IPIC), the SCP returns an *Analyze-Route* message with the dialed digits and identifying the trunk group for the AT&T Point of Presence. The SSP will route the call using the specified trunk group and signaling to the AT&T Point of Presence.

e) If the call is 0+7 or 10 digits and is intraLATA toll, and the ILEC network supports IPIC, the SCP returns an *Analyze-Route* message containing the digits originally dialed. The SSP will route the call according to the office dialing plan (ODP) and the selected intraLATA toll carrier of the calling party.

9. If the call is 411, 555-1212, NPA-555-1212 (intraLATA), the SCP returns an *Analyze-Route* message containing the routing number specified by AT&T. (NOTE: For AT&T Local Directory Assistance service, the routing number will be a 900-number.)

10. The SSP routes the call in the line-applicable dialing plan.

5.1.3.3 Directory Assistance, Using N11 and 3/6/10 Digit Triggers

Assume an N11, and 3/6/10 digit trigger for all customers. Thus, every call made by a local customer that begins with the digits 411, 555-121, NPA-555-1212 (the ILEC-specific NPA), would produce a query. Since these triggers are office-wide, all local service providers served on the switch must agree to this method.

1. AT&T customer goes off hook.
2. The ILEC end office looks up customer record.
3. The ILEC end office transmits dial tone.
4. AT&T customer dials.
5. The ILEC end office collects the digits and recognizes 411, 555-121, or NPA-555-1212, where NPA is defined to ensure the call is local or intraLATA.
6. SSP (end office / access tandem) creates the query.
7. The SSP sends the query in an *Info-Analyzed* message including the entire digit string dialed, and the type of trigger that occurred for the longest sequence, and waits for the SCP response.

8. The SCP identifies AT&T as the provider of local service for the Calling Party Number, and then returns routing instructions and digits in an *Analyze-Route* message for all of these calls as specified by AT&T.

9. The SSP routes the call to for the provided number according to the ODP

5.2 Assessment of the AIN Solution

5.2.1 Advantages of the AIN Solution

1. AIN 0.1 is designed to provide the types of flexible call control described here. There is a good "fit" between its architecture and these needs.

2. An AIN 0.1 solution can be tailored to support a variety of local regulatory and service needs. The application can also be updated as these needs change.

3. An AIN 0.1 solution is valid for ISDN and analog customers, both business and residence, that are served on the 1A ESS™ and 5ESS® switches.

4. One SCP pair can support multiple switches in the ILEC's network.

5. One AIN application, with logic for appropriate specification of correct routing information, could support routing of Operator Service and / or Directory Assistance calls wherever ALECs enter the local service market using Total Services Resale or Unbundled Network Element.

6. AIN 0.1 has multiple applications besides that described here. Infrastructure acquired to support this application can be used for many other added-value services.

7. The IDP/CDP trigger has the advantage of querying only on calls where needed.

5.2.1 Limitations of the AIN Solution

1. The penetration rate for AIN and NAP functionality limits the applicability of these solutions. However, the penetration rate for AIN in the areas where other local service providers desire to provide service may be higher than the overall rate. Furthermore, NAP functionality increases the availability. AIN 0.1 penetration is reported by city in the ILEC's report to the FCC.

2. The necessary AIN feature logic(s) must be developed and installed in either the SCP belonging to AT&T or the ILEC.

3. The ILEC must provision the appropriate AIN trigger for customers as applicable.

4. AIN service provisioning processes must consider the feature interactions specific to the trigger and customer's class of service. An example is when a customer already subscribed to an IDP feature, such as Centrex intercom service, the provisioning will be complex. Interactions with the IDP service logic must be analyzed for proper provisioning and to avoid misrouting of calls.

5. Where a non-subscribed trigger is used (e.g., 3/6/10 digits), all local service providers' customers experience identical delays.

5.2.2 Summary Evaluation of the AIN Solution

1. All four of the AIN 0.1 triggers described in this document may be used for selective routing of Directory Assistance traffic to the AT&T Point of Presence, with the exception that N11 is applicable if "411" is the only dialed access code.

2. Offhook Delayed Trigger and IDP Trigger may be used for selective routing of Operator Service traffic to the AT&T Point of Presence

3. The necessary AIN feature logic(s) must be developed and installed in the SCP belonging to either AT&T or the ILEC.

4. AIN provides several ways to support selective routing of Operator Service and / or Directory Assistance traffic to AT&T Point of Presence. One of its most significant strengths is the flexibility and generalizability offered by its architecture. In situations where AIN is already deployed for other added-value services (e.g., Enhanced Call Forwarding), the cost is less significant.

6. ADVANCED SERVICE INTERFACE (ASI) PROXY SOLUTION

6.1 Technical Feasibility of the ASI Proxy Solution

6.1.1 Description

The Advanced Services Interface (ASI) Proxy feature can be used to support selective routing of AT&T local service customers' Directory Assistance traffic to an AT&T Point of Presence. Local Directory Assistance calls from the AT&T local service customers would be connected to an AT&T or ILEC Intelligent Peripheral (IP). The IP application software to be developed would determine the appropriate call treatment and would then instruct the ILEC end office how to route and handle the call.

For this service, the Proxy Explicit Mode appears to be preferable to the Implicit Mode. Explicit Mode permits selective handling for only the specific dialing sequences associated with the Directory Assistance service (e.g., 411, 555-1212, etc.) in a manner consistent with normal dialing patterns.

Explicit mode access codes must be defined in the ILEC end office. Normally, these would be defined in the switch Office Dialing Plan. It is important that AT&T local service customers be able to use "traditional" dialing sequences to access local Directory Assistance service (e.g., 411 and 555-1212). If these sequences are defined as explicit access codes in the Office Dialing Plan, all calls beginning with these sequences (including those from the ILEC's customers) would be routed to the IP. It should be possible to be selective about which customer calls are routed to the IP. In the 5ESS® Switch, the Individualized Dialing Plan (IDP) feature can be used to define 411, etc. as explicit access codes. The IDP would only be used for calls from AT&T local service customers.

6.1.2 Assumptions

1. Access using Proxy should not change the call flows once the call has been routed to the AT&T Point of Presence.

2. The explicit access mode will be used since any digits entered by the caller during the first 20 seconds on implicit access mode will be interpreted by the ILEC end office.

3. The explicit access code for local Directory Assistance must include 411. If the ILEC supports other local Directory Assistance access arrangements (e.g., 555-1212, NPA-555-1212), they must also be explicit access codes.

6.1.3 Call Flows

6.1.3.1 Local Directory Assistance

1. AT&T customer goes off hook.
2. The ILEC end office looks up customer record which shows the customer has Proxy service, with 411, 555-1212, and NPA-555-1212 as explicit access codes. (NPA specific to the ILEC.)
3. The ILEC end office transmits dial tone.
4. ILEC end office performs line screening.
5. AT&T customer dials 411, or 555-1212, or NPA-555-1212 (NPA is an intraLATA NPA).
6. The ILEC end office routes the call to the IP.
7. The IP will translate any of these dialed digit sequences into a routing number specified by AT&T. (Note: For AT&T Local Directory Assistance service, the routing number will be a 900 number.)
8. The IP will pass this routing number back to the ILEC end office.
9. The ILEC end office will route the call based on the routing number.
10. The ILEC end office switch would create an access record.

6.2 Assessment of the ASI Proxy Solution

6.2.1 Advantages of the ASI Proxy Solution

1. Proxy service can be supported by the 5ESS® switch, the 1A ESS™ switch and the DMS 100/200 switches.
2. Proxy service is assigned per-subscriber.
3. The IP application can be tailored to support a variety of local regulatory and service needs. The application can also be updated as these needs change.
4. Anything the Proxy IP dials for the subscriber is applied to the subscriber's terminal just as if the subscriber had dialed.
5. Proxy supports DP or DTMF signaling
6. Once Proxy service is completed (i.e. the translation made), the IP platform drops out of the call. That is, there is no "hairpinning" required.

6.2.1 Limitations of the ASI Proxy Solution

1. The IP application software must be developed and installed at the IP.

2. ASI Proxy service provisioning processes must consider the feature interactions specific to the Proxy Service and the customer's class of service. An example is when a customer already subscribed to an IDP feature, such as Centrex intercom service, the provisioning will be complex. Interactions with the IDP service logic must be analyzed for proper provisioning and to avoid misrouting of calls.

3. The IDP trigger may not be available on 1A switches. Even though the 1A ESS switch supports ASI Proxy, the 1A ESS may not support IDP trigger and therefore cannot support selective routing of DA calls.

6.2.1 Summary Evaluation of the ASI Proxy Solution

1. ASI Proxy provides a way to support selective routing of Directory Assistance traffic to AT&T Point of Presence.

2. The IP application software must be developed and installed at the IP.

3. Proxy service is assigned per-subscriber.

Attachment RVF-3
32 Total Pages

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